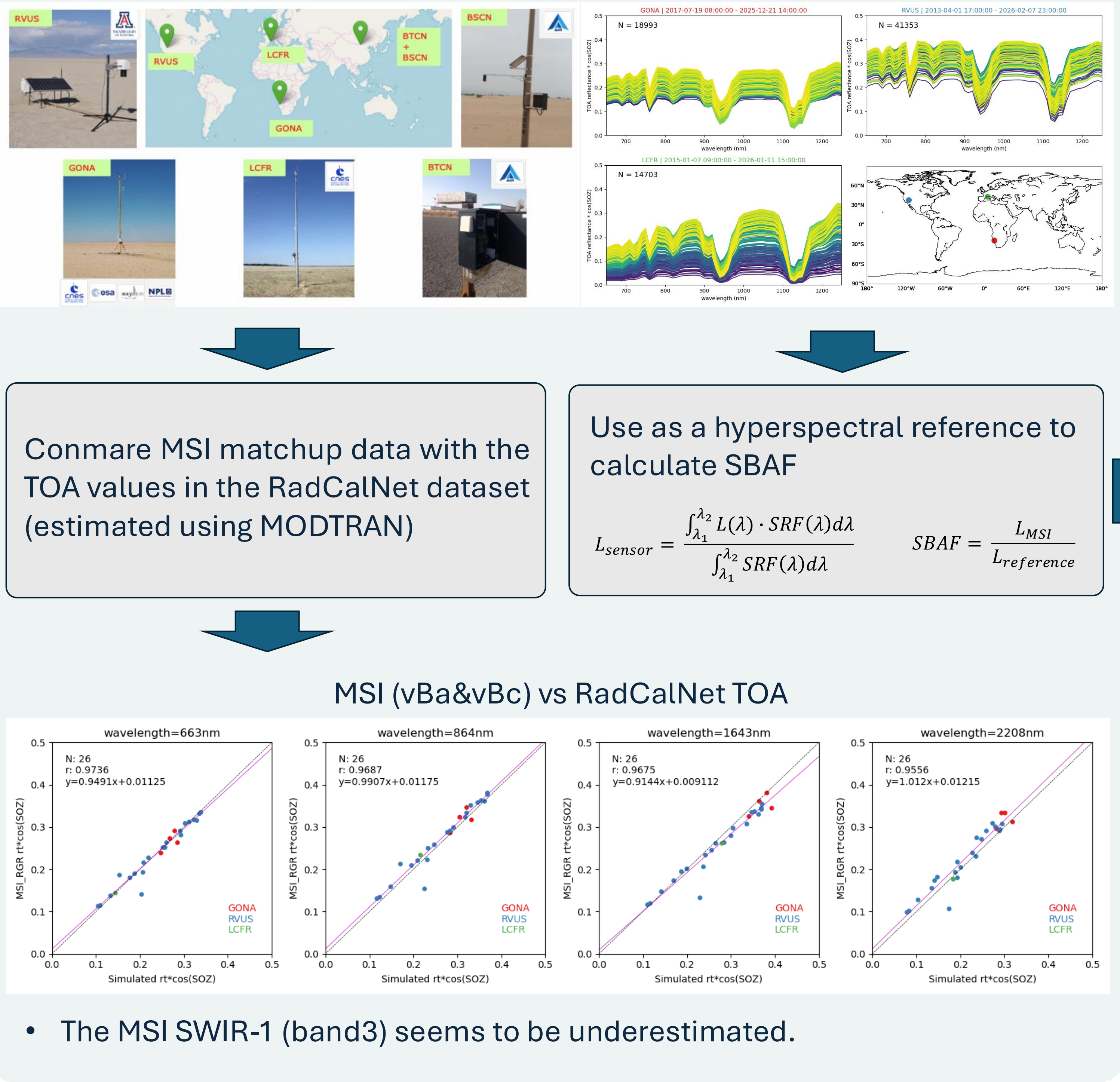


1. Introduction

Accurate radiometric calibration for the Multi-Spectral Imager (MSI) onboard EarthCARE is essential for quantitative retrievals and synergistic use with other EarthCARE instruments. Post-launch validation of MSI is particularly important because the onboard solar diffuser has shown unstable performance, requiring radiometric corrections based on external references. Independent assessments of MSI radiometric accuracy are therefore needed.

In this study, we evaluate MSI observations using multiple approaches: (1) validation using RadCalNet reference sites and (2) direct intercomparisons with geostationary satellites (Himawari-9/AHI and MTG/FCI). The consistency of MSI top-of-atmosphere reflectance and brightness temperature is assessed to investigate the radiometric performance of MSI.

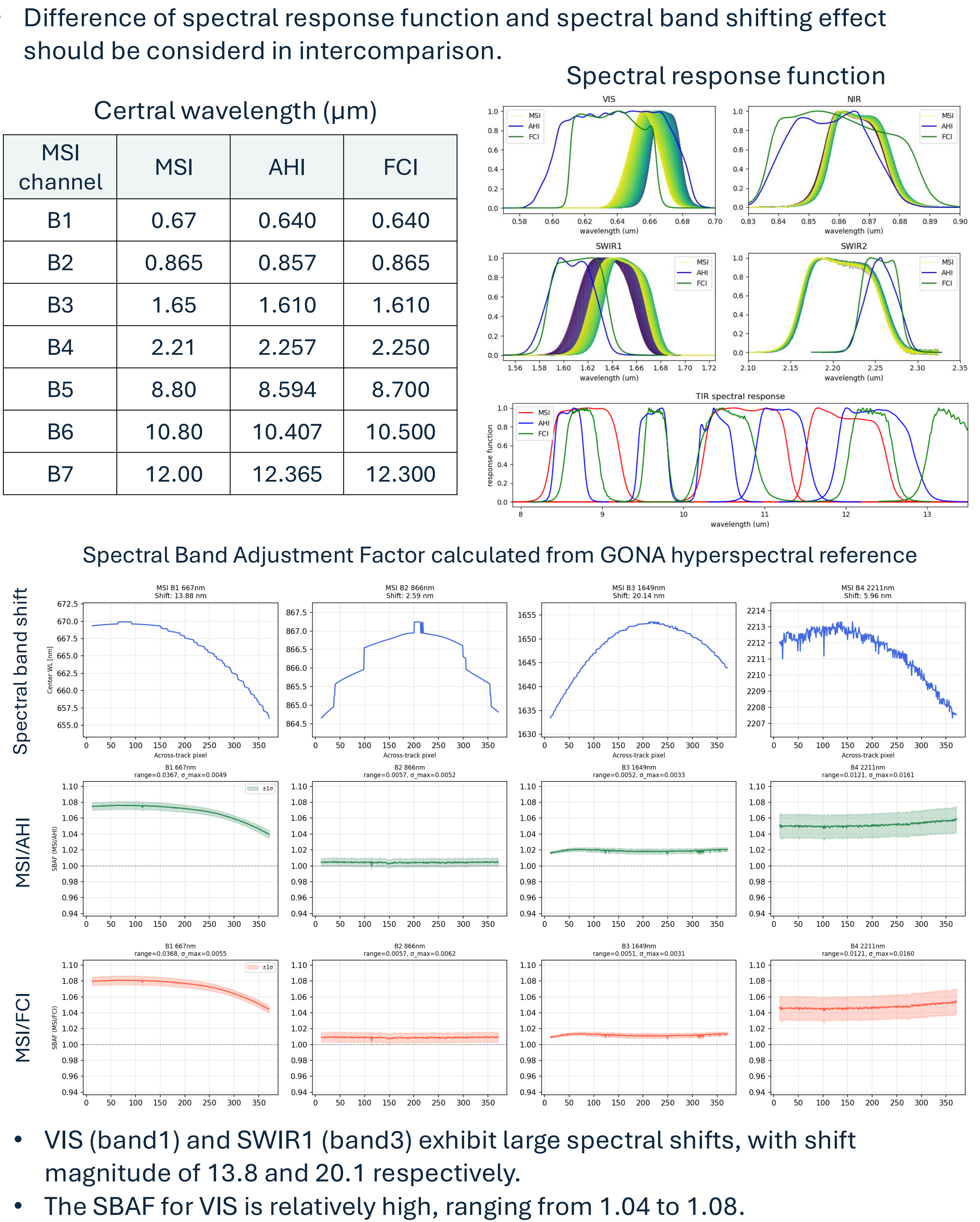
3. RadCalNet [\(Bouvet et al., 2019\)](#)
- 
- An international framework by CEOS/WGCV (IVOS) for radiometric calibration and validation of satellite optical sensors.
 - Provides SI-traceable Top-of-Atmosphere (TOA) reflectance products to support post-launch calibration of Earth-observation satellites.
 - Delivers data at 10 nm spectral intervals, covering 400–2500 nm, updated every 30 minutes via an open-access portal.



2. MSI_RGR Version History

Baseline	Date	updates
vAf	2024/07/16~2025/05/27	Diffuser BSDF update
vBa	2024/07/16~2025/11/18	MSI VNS maintenance gain update and usage of theoretical TSIS-2 based solar spectral irradiance.
vBc	2025/11/18~2026/04/23	-
vBd	2026/04/23~present	MSI SWIR1 maintenance gain update

4. Spectral Response Function and Band Shift



5. Direct Intercomparison with GEO satellites

